# TA-F110/F210

## **SERVICE MANUAL**



AEP Model
UK Model
TA-F110/F210
E Model
TA-F110

Photo: TA-F210

#### **SPECIFICATIONS**

#### **Amplifier**

Continuous RMS power output (both channels driven simultaneously)

#### AEP model

			TA-F110	TA-F210
DIN	, 1 kHz	4 ohms	40W + 40W	80W + 80W
	-	8 ohms	30W + 30W	57W + 57W
20 1	20 Hz – 20 kHz	4 ohms	27W + 27W	50W + 50W
THE	0.05%	8 ohms	24W + 24W	40W + 40W

#### UK, E model

	TA-F110	TA-F210
DIN, 1 kHz, 8 ohms	40W + 40W	70W + 70W
20 Hz - 20 kHz THD 0.05%, 8 ohms	30W + 30W	50W + 50W

#### Input

Input jack		Jack type	Sensitivity	
PHONO MM		Phono	2.0 mV	
TUNER, CD, VIDE	Phono	150 mV		

	Impedance	S/N (weighting network, input level)
v	50 kilohms	70 dB (A, 2 mV)
	50 kilohms	100 dB (150 mV)

#### Output

Output jack	Jack type	Voltage/impedance		
REC OUT	Phono jacks	Voltage 150 mV Impedance 1 kohms		
SPEAKERS		AEP model: Accepts speakers of 4 – 16 ohms.  UK, E model: Accepts speakers of 8 – 16 ohms.		
HEAD- PHONES	Stereo phone jack	Accepts low and high impedance headphones.		

#### Tone controls

	Response	Turnover frequency
BASS	±7 dB (100 Hz)	500 Hz
TREBLE	±8 dB (15 kHz)	3 kHz)

Loudness (Attenuation 30 dB) (TA-F210 only) +3 dB (100 Hz) +3 dB (10 kHz)

- Continued on next page -



Harmonic distortion Less than 0.05% at rated output Intermodulation (IM) distortion (60 Hz:7 kHz = 4:1)

Less than 0.05% at rated output

Frequency response

PHONO: RIAA equalization curve

 $\pm 0.5\,\mathrm{dB}$ 

TUNER, CD, VIDEO/AUX, TAPE1, TAPE2/DAT: 7 Hz – 100 kHz ±3 dB

Residual noise Less than 170  $\mu$ V (network A)

Damping factor 40 (8 ohms, 1 kHz)

General

System Preamplifier: Low-noise, high-gain

equalizer amplifier

Power amplifier: Pure-complementary SEPP OCL power amplifier with all

stages directly coupled

Power requirements AEP model: 220 V AC, 50 Hz

UK model: 240 V AC, 50 Hz

E model: 120 V, 220 V or 240 V AC

adjustable, 50/60 Hz

Power consumption AEP model:

TA-F110: 90W TA-F210: 150W UK model: TA-F110: 160W TA-F210: 260W

E model: TA-F110: 70W

Dimensions Approx. 430 × 135

Approx.  $430 \times 135 \times 315$  mm (w/h/d)

 $(17 \times 5^{3})/_{8} \times 12^{1}/_{2}$  inches)

Weight AEP model:

TA-F110: Approx. 5.7 kg (12 lb 9 oz) TA-F210: Approx. 7.4 kg (16 lb 5 oz)

UK model:

TA-F110: Approx. 5.6 kg (12 lb 6 oz)

TA-F210: Approx. 6.8 kg (15 lb)

E model:

TA-F110: Approx. 5.6 kg (12 lb 6 oz)

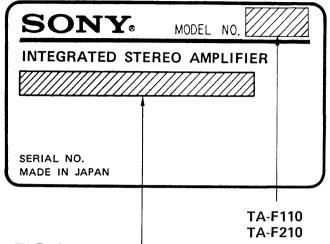
Design and specifications subject to change without notice.

#### **SAFETY-RELATED COMPONENT WARNING!!**

COMPONENTS IDENTIFIED BY MARK A OR DOTTED LINE WITH MARK ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

#### MODEL IDENTIFICATION

Specification Label —



TA-F110:

AEP Model: AC: 220 V  $\sim$  50/60 Hz UK Model: AC: 240 V  $\sim$  50/60 Hz

E Model: AC: 120, 220, 240 V ~ 50/60 Hz

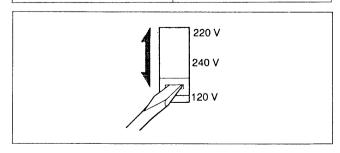
TA-F210:

AEP Model: AC: 220 V  $\sim$  50/60 Hz UK Model: AC: 240 V  $\sim$  50/60 Hz

#### On operating voltage

Before operating the unit, check that the operating voltage of your unit is identical with the voltage of your local power supply.

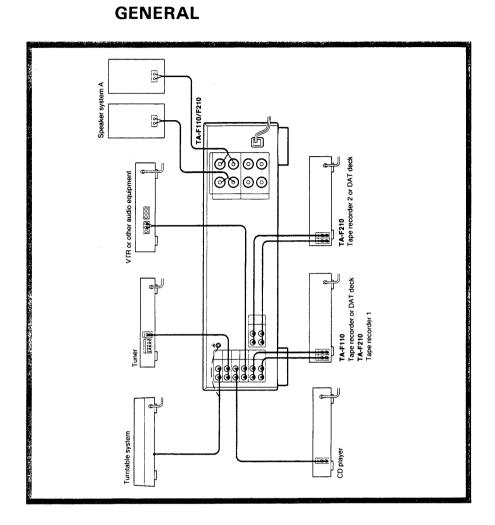
Where purchased	Operating voltage
UK model	240 V AC
AEP model	220 V AC
E model	120 V, 220 V or 240 V AC adjustable The voltage selector is located on the rear panel. If the selector must be reset, disconnect the AC power cord and set the selector to the proper voltage of your local power supply.



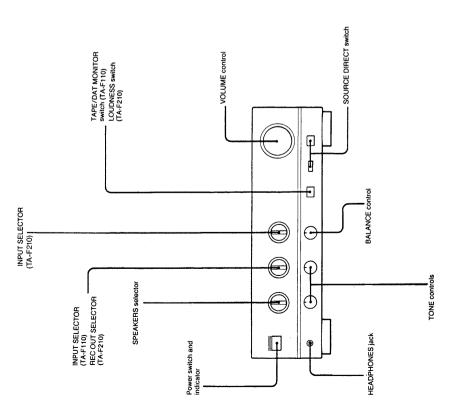
Connections

# Notes on Connection

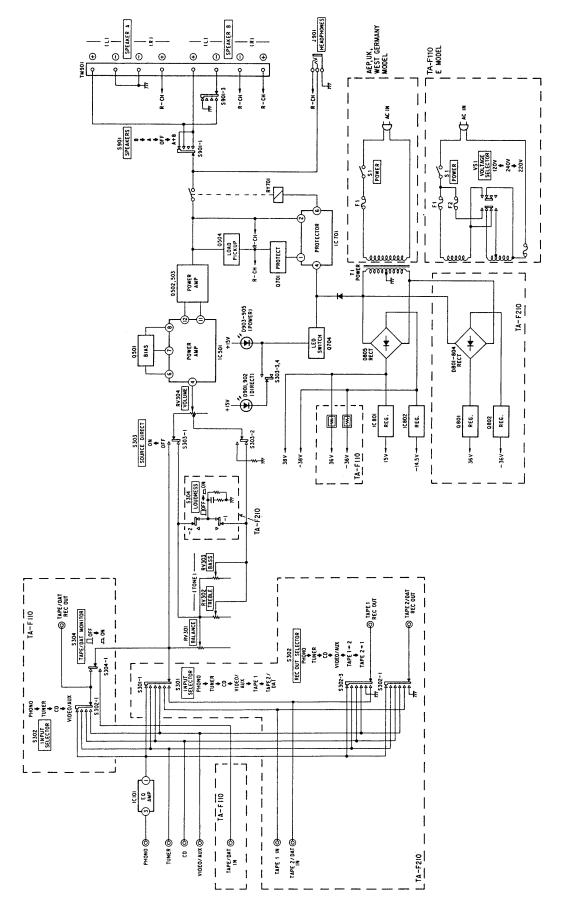
- Connect the AC power cord last. Make sure power is off.
   Cord plugs and jacks are color coded. Red plugs and jacks are tor right channel (R) and white ones for left channel (L).
   Fully insert cable connectors into jacks. Loose connections may cause hum or noise.



**SECTION 1** 



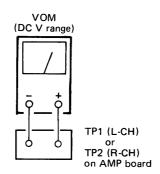
## SECTION 2 BLOCK DIAGRAM



## SECTION 3 ELECTRICAL ADJUSTMENTS

#### NOTE:

 Adjustment should be performed 10 minutes after the POWER switch is on (POWER ON).



#### Bias Current Adjustment

Note: This adjustment should be performed under thermal stable condition. Before starting the adjustment, wait for more than an hour after switch off for cooling, and perform the adjustment within one minute after switching on.

#### Procedure:

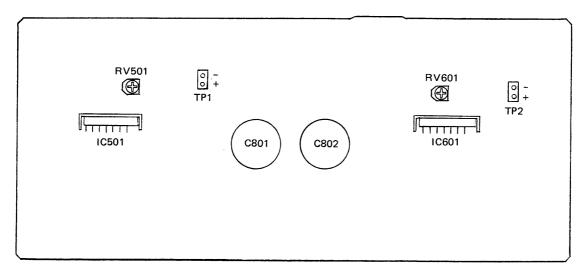
- 1. Set main volume to minimum position.
- 2. Switch on the set.
- 3. Adjust RV501 (RV601 for right channel) so that the voltage across TP1 and TP2 becomes the value indicated below.

#### Adjustment values:

TA-F110  $4\text{mV} \pm 0.3\text{mV}$ TA-F210  $2\text{mV} \pm 0.3\text{mV}$ 

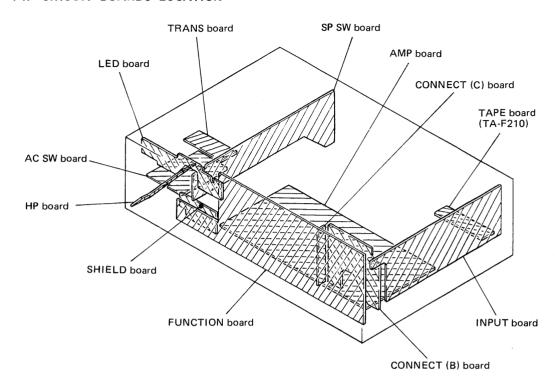
#### Adjustment Location:

[AMP BOARD] - Component Side -

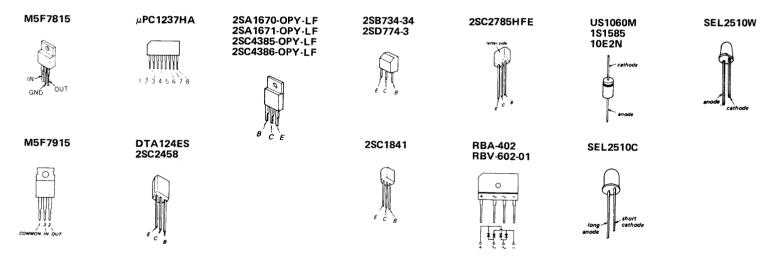


### **SECTION 4 DIAGRAMS**

#### 4-1. CIRCUIT BOARDS LOCATION

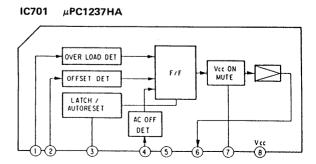


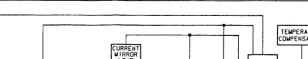
#### 4-2. SEMICONDUCTOR LEAD LAYOUTS

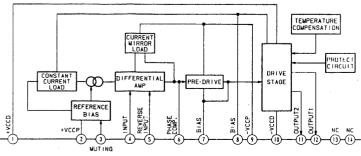


IC501, 601 μPC1298V

#### 4-3. IC BLOCK DIAGRAMS





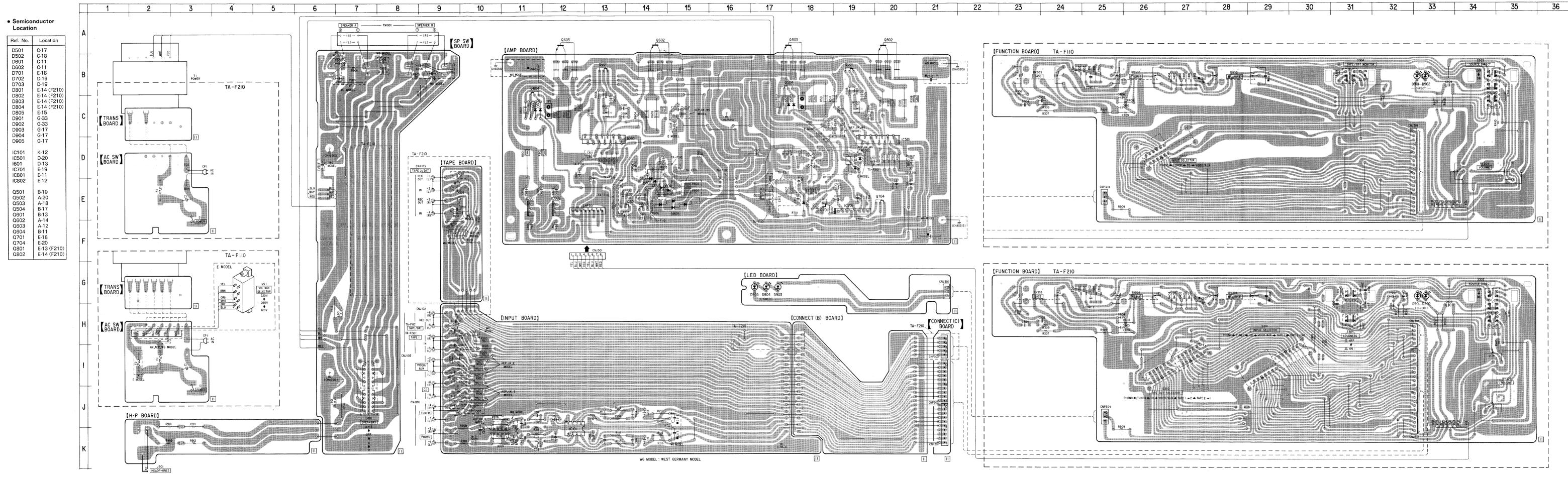


4-4. PRINTED WIRING BOARDS 

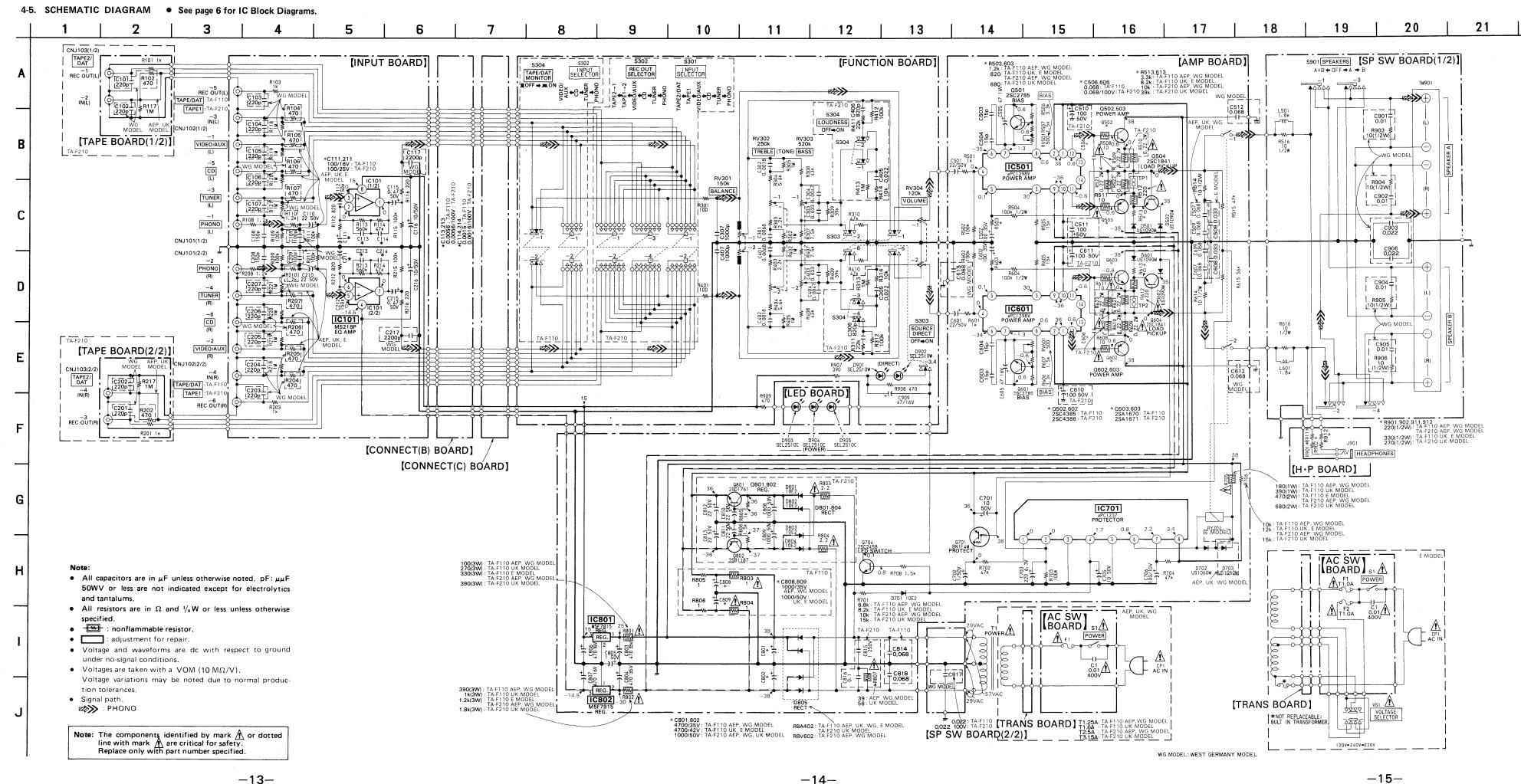
• See page 6 for Circuit Boards Location and Semiconductor Lead Layouts.

Note

• o——: parts extracted from the component side.



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## SECTION 6 EXPLODED VIEWS

#### NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts Example:

(RED) ...KNOB, BALANCE (WHITE)

↑

Cabinet's Color

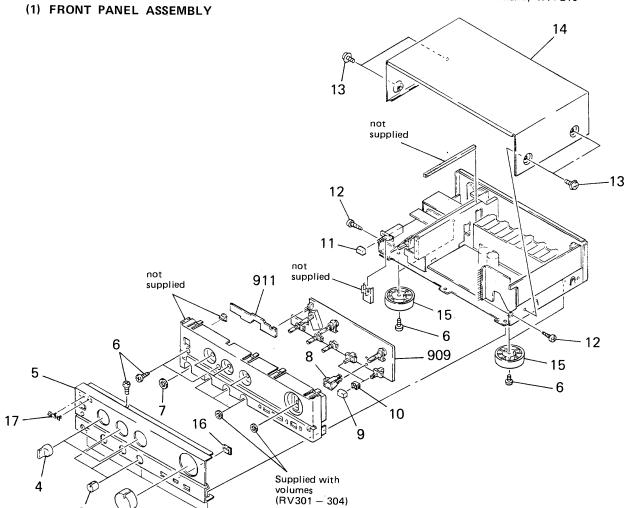
Parts Color

The components identified by mark A or dotted line with mark A are critical for safety.
Replace only with part number specified.

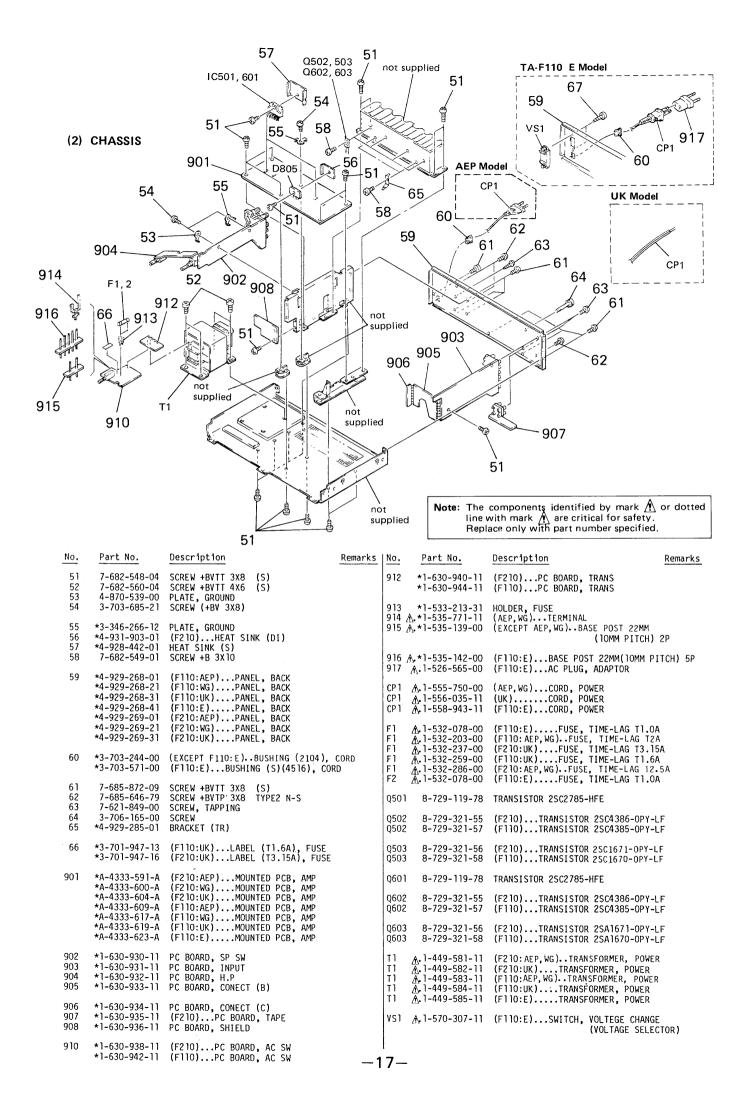
Abbreviation

WG: West Germany Model

Illustration
 Mainly TA-F210



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	3-703-685-21	SCREW (+BV 3X8)		11	4-929-289-01	BUTTON	
2	4-929-288-11 4-929-299-01	(F110)KNOB (VOL 47) (F210)KNOB (47)		12 13 14	7-685-646-79 3-704-366-01 4-929-294-11	SCREW +BVTP 3X8 TYPE2 N-S SCREW (CASE) (M3X8) CASE	
3 4	4-916-746-11 4-916-729-01	KNOB (DIA.21), ROUND KNOB (DIA.29)		15		(EXCEPT F110:E)FOOT ASSY (F110:E)FOOT ASSY	
5	4-929-293-01 4-929-293-11	(F110)PANEL, FRONT (F210)PANEL, FRONT		16 17	4-929-284-01 4-908-848-01	PLATE, INDICATION EMBLEM, SONY	
6 7 8	7-682-548-04 4-931-902-01 *4-921-389-01	SCREW +BVTT 3X8 (S) NUT (M12X1) HOUSE		909	*1-630-937-11 *1-630-941-11	(F210)PC BOARD, FUNCTION (F110)PC BOARD, FUNCTION	
9 10	4-908-875-01 4-864-307-00	KNOB, SQUARE RING		911	*1-630-939-11 *1-630-943-11	(F210)PC BOARD, LED (F110)PC BOARD, LED	



### **SECTION 7 ELECTRICAL PARTS LIST**

#### NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS: MF: μF, PF: μμF.

#### RESISTORS

- All resistors are in ohms.
  F: nonflammable

• MMH: mH, UH: μH

#### **SEMICONDUCTORS**

In each case, U:  $\mu$ , for example: UA...:  $\mu$ A..., UPA...:  $\mu$ PA..., UPC...:  $\mu$ PD...

The components identified by mark \( \underbrack \) or dotted line with mark \( \underbrack \) are critical for safety.

Replace only with part number specified.

Abbreviation WG: West Germany Model

Ref.No.	Part No.	Description			Ref.No.	Part No.	Description			
901	*A-4333-591-A *A-4333-600-A *A-4333-604-A	(F210:AEP)MOUNTED PCB, F (F210:WG)MOUNTED PCB, F (F210:UK)MOUNTED PCB, F	AMP		C114 C114	1-130-278-11 1-130-473-00	(F210)FILM (F110)MYLAR	0.0016MF 0.0015MF		100V 50V
	*A-4333-609-A *A-4333-617-A *A-4333-619-A *A-4333-623-A	A (F110:AEP)MOUNTED PCB, AMP A (F110:WG)MOUNTED PCB, AMP A (F110:UK)MOUNTED PCB, AMP		2	C115 C116 C117	1-124-902-00 1-123-875-11 1-164-091-11	ELECT ELECT (WG)CERAMI	0.47MF 10MF C 2200PF	20% 20% 10%	50V 50V 50V
902 903 904	*1-630-930-11 *1-630-931-11 *1-630-932-11	PC BOARD, SP SW PC BOARD, INPUT PC BOARD, H.P			C201 C202 C203	1-162-286-31 1-162-286-31 1-162-286-31	(F210:WG)CER (F210:WG)CER (WG)CERAMIC	AMIC 220P 220PF	F 10% 10%	50V 50V 50V
905 906 907	*1-630-933-11 *1-630-934-11 *1-630-935-11	PC BOARD, CONECT (B) PC BOARD, CONECT (C) (F210)PC BOARD, TAPE			C204 C205 C206	1-162-286-31 1-162-286-31 1-162-286-31	(WG)CERAMIC (WG)CERAMIC	220PF 220PF	10% 10% 10%	50V 50V 50V
908 909	*1-630-936-11 *1-630-937-11 *1-630-941-11	PC BOARD, SHIELD  (F210)PC BOARD, FUNCTION (F110)PC BOARD, FUNCTION			C207 C208 C209 C210	1-162-286-31 1-164-075-11 1-164-070-11 1-126-233-11	(WG)CERAMIC CERAMIC (WG)CERAMIC ELECT	150PF	10% 10% 5% 20%	50V 50V 50V 50V
910	*1-630-938-11 *1-630-942-11	(F210)PC BOARD, AC SW (F110)PC BOARD, AC SW			C211 C211	1-123-333-00 1-126-101-11	(F210)ELECT (F110)ELECT	100MF 100MF	20%	25V 16V
911	*1-630-939-11 *1-630-943-11	(F210)PC BOARD, LED (F110)PC BOARD, LED		i	C212	1-164-075-11	CERAMI C	150PF	10%	50 <b>V</b>
912	*1-630-940-11 *1-630-944-11	(F210)PC BOARD, TRANS (F110)PC BOARD, TRANS			C213 C213	1-130-339-00 1-130-480-00	(F210)FILM (F110)MYLAR	0.0056MF 0.0056MF		100V 50V
913 914 A	*1-533-213-31 .*1-535-771-11	HOLDER, FUSE (AEP, WG)TERMINA	ı		C214 C214	1-130-278-11 1-130-473-00	(F210)FILM (F110)MYLAR	0.0016MF 0.0015MF		100V 50V
	*1-535-139-00	(EXCEPT AEP, WG)BASE PO (10MM F	ST 22		C215 C216 C217	1-124-902-00 1-123-875-11 1-164-091-11	ELECT ELECT (WG)CERAMIO	0.47MF 10MF 2200PF	20%	50V 50V 50V
	.*1-535-142-00 \(\lambda.1-526-565-00\)	(F110:E)BASE POST 22MM(10(F110:E)AC PLUG, ADAPTOR		ITCH)5P	C301	1-130-481-00	MYLAR 0	.0068MF	5% 5%	50 <b>V</b> 50 <b>V</b>
C1 C101	1-161-744-00 1-162-286-31	CERAMIC 0.01MF (F210:WG)CERAMIC 220PF	10%	400V 50V	C302 C303	1-130-474-00 1-136-159-00	FILM 0.	.0018MF .033MF	5%	. 50V
C102	1-162-286-31 1-162-286-31	(F210:WG)CERAMIC 220PF (WG)CERAMIC 220PF	10% 10%	50V 50V	C304 C305 C306	1-130-479-00 1-136-157-00 1-164-084-11	MYLAR 0 (F210)FILM 0 (F210)CERAM		5% 5% 10%	50V 50V 50V
C104 C105	1-162-286-31 1-162-286-31	(WG)CERAMIC 220PF (WG)CERAMIC 220PF	10% 10%	50V 50V	C307 C401	1-164-085-11 1-130-481-00		000PF .0068MF	10% 5%	50V 50V
C106 C107	1-162-286-31 1-162-286-31 1-164-075-11	(WG)CERAMIC 220PF (WG)CERAMIC 220PF	10% 10% 10%	50V 50V 50V	C402	1-130-474-00	MYLAR 0	.0018MF	5% 5%	50V
C108	1-164-070-11	CERAMIC 150PF  (WG)CERAMIC 100PF	5%	50V	C403 C404 C405	1-130-153-00 1-130-479-00 1-136-157-00		.0047MF	5% 5%	50V 50V
C110	1-126-233-11	ELECT 22MF (F210)ELECT 100MF	20%	50V 25V	C406 C407	1-164-084-11 1-164-085-11		000PF	10% 10%	50V 50V
C111		(F110)ELECT 100MF	20%	167	C501	1-123-357-00		2MF	20%	50V 35V
C112 C113 C113	1-164-075-11 1-130-339-00 1-130-480-00	CERAMIC 150PF 0.0056MF (F110)MYLAR 0.0056MF	10% 5% 5%	50V 100V 50V	C502 C503 C504 C505	1-123-345-00 1-164-023-11 1-164-023-11 1-124-477-11	CERAMIC 1	OOMF 5PF 5PF 7MF	5% 5% 20%	50V 50V 50V

Ref.No.	Part No.	Description	1
C506	1-130-317-00	(F210)FILM	0.068MF 5% 100V
C506	1-136-163-00	(F110)FILM	0.068MF 5% 50V
C507	1-136-163-00	(EXCEPT F110:E)F	0.033MF 5% 50V
C508	1-136-159-00	(F110:E)FILM	
C509	1-136-163-00	(EXCEPT F110:E)F	
C510	1-124-122-11	(F210)ELECT	100MF 20% 50V
C511	1-124-122-11	(F210)ELECT	100MF 20% 50V
C512	1-136-163-00	(WG)FILM	0.068MF 5% 50V
C601	1-123-357-00	ELECT 22MF	20% 50V
C602	1-123-345-00	ELECT 100MF	20% 35V
C603	1-164-023-11	CERAMIC 15PF	5% 50V
C604	1-164-023-11	CERAMIC 15PF	5% 50V
C605	1-124-477-11	ELECT 47MF	20% 16V
C606	1-130-317-00	(F210)FILM 0.0	68MF 5% 100V
C606	1-136-163-00	(F110)FILM	0.068MF 5% 50V
C607	1-136-163-00	(EXCEPT F110:E)F	ILM 0.068MF 5% 50V
C608	1-136-159-00	(F110:E)FILM	0.033MF 5% 50V
C609	1-136-163-00	(EXCEPT F110:E)F	ILM 0.068MF 5% 50V
C610	1-124-122-11	(F210)ELECT	100MF 20% 50V
C611	1-124-122-11	(F210)ELECT 100	MF 20% 50V
C613	1-136-163-00	(WG)FILM 0.0	68MF 5% 50V
C612	1-136-163-00	(WG)FILM 0.0	
C701	1-123-875-11	ELECT 10M	
C702	1-124-499-11	ELECT 1MF	
C703	1-126-176-11	ELECT 220MF	20% 6.3V
C705	1-123-875-11	ELECT 10MF	20% 50V
C706	1-124-443-00	ELECT 100MF	20% 10V
C801	1-125-536-11	(F210)ELECT	4700MF 20% 42V
C801	1-126-224-11	(F110:UK,E)ELECT	
C801	1-126-256-11	(F110:AEP,WG)ELE	
C802	1-125-536-11	(F210)ELECT	4700MF 20% 42V
C802	1-126-224-11	(F110:UK,E)ELECT	
C802	1-126-256-11	(F110:AEP,WG)ELE	
C803	1-126-104-11	ELECT 470MF	20% 35V
C804	1-126-104-11	ELECT 470MF	20% 35V
C805	1-124-499-11	ELECT 1MF	20% 50V
C806	1-126-103-11	ELECT 470MF	20% 16V
C807	1-126-103-11	ELECT 470MF	20% 16V
C808 .	1-124-637-11 1-126-105-11	(EXCEPT F110:AEP, WGELECT (F110:AEP, WG)ELE	1000MF 20% 50V CT 1000MF 20% 35V
C809	1-124-637-11 1-126-105-11	(EXCEPT F110: AEP, WGELECT (F110: AEP, WG)ELE	1000MF 20% 50V
C810	1-126-233-11	(F210)ELECT 22	2MF 20% 50V
C811	1-126-233-11		2MF 20% 50V
C812	1-123-357-00		2MF 20% 50V
C813	1-123-357-00		RMF 20% 50V
C814	1-136-163-00		068MF 5% 50V
C815	1-130-798-00		MF 10% 250V
C816	1-136-165-00	(F210)FILM 0.	
C817	1-162-596-11	(F110:WG)CERAMIC	
C817	1-130-973-00	(F210:WG)FILM 0.	
C818	1-136-163-00		068MF 5% 50V
C909	1-124-477-11		MF 20% 16V
C901	1-164-096-11	(WG)CERAMIC O.	.01MF 50V
C902	1-164-096-11		.01MF 50V
C903	1-162-596-11		.022MF 25V

Ref.No.	Part No.	Description
C904 C905 C906	1-164-096-11 1-164-096-11 1-162-596-11	(WG)CERAMIC 0.01MF 50V (WG)CERAMIC 0.01MF 50V (WG)CERAMIC 0.022MF 25V
	1-565-320-11 1-565-320-11	JACK, PIN 6P (PHONO/TUNER/CD) JACK, PIN 6P
CNJ103	1-568-529-21	(VIDEO,AUX/TAPE,DAT OR TAPE 1) (F210)JACK, PIN 4P (TAPE 2,DET)
CNJ302	1-565-961-11 *1-565-835-11 *1-561-650-00	SOCKET, CONNECTOR 20P SOCKET, CONNECTOR 3P (F210)SOCKET, CONNECTOR 5P
CNP302	1-565-419-11 1-565-419-11 1-506-906-11	PIN, CONNECTOR 10P PIN, CONNECTOR 10P (F210)PIN, CONNECTOR 5P
	1-568-577-11 *1-564-511-11	PIN, CONNECTOR (PC BOARD) 3P PLUG, CONNECTOR 8P
CP1 🚹	\.1-555-750-00 \.1-556-035-11 \.1-558-943-11	(AEP)CORD, POWER (UK)CORD, POWER (Fllo:E)CORD, POWER
D501 D502 D601	8-719-815-85 8-719-815-85 8-719-815-85	DIODE 1S1585 DIODE 1S1585 DIODE 1S1585
D602 D701 D702	8-719-815-85 8-719-200-77 8-719-000-26	DIODE 1S1585 DIODE 10E2N DIODE US1060M
D703 D801 D802	8-719-000-26 8-719-200-77 8-719-200-77	(EXCEPT F110:E)DIODE US1060M (F210)DIODE 10E2N (F210)DIODE 10E2N
D803 D804	8-719-200-77 8-719-200-77	(F210)DIODE 10E2N (F210)DIODE 10E2N
D805 D805	8-719-302-38 8-719-312-09	(F210: AEP, WG)DIODE RBV-602-01 (EXCEPT F210: AEP, WG)DIODE RBA-402
D901 D902 D903	8-719-304-14 8-719-304-14 8-719-303-00	DIODE SEL2510W DIODE SEL2510W DIODE SEL2510C
D904 D905	8-719-303-00 8-719-303-00	DIODE SEL2510C DIODE SEL2510C
F1 2 F1 2 F1 2	♠. 1-532-078-00 ♠. 1-532-285-00 ♠. 1-532-237-00 ♠. 1-532-259-00 ♠. 1-532-286-00	(F110:E)FUSE, TIME-LAG T1.0A (F110:AEP,WG)FUSE, TIME-LAG T1.25A (210:UK)FUSE, TIME-LAG T3.15A (F110:UK)FUSE, TIME-LAG T1.6A (F210:AEP,WG)FUSE, TIME-LAG T2.5A
F2	<u>^</u> .1-532-078-00	(F110:E)FUSE, TIME-LAG T1.0A
IC101 IC501 IC601	8-759-601-02 8-759-109-06 8-759-109-06	IC M5218P IC UPC1298V IC UPC1298V
I C701 I C801 I C802	8-759-604-34	IC UPC1237HA IC M5F7815 IC M5F7915
J901	1-507-863-51	JACK, LARGE TYPE (HEADPHONES)
L501 L601	*1-420-872-00 *1-420-872-00	COIL, AIR CORE COIL, AIR CORE
Q501	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q502 Q502	8-729-321-55 8-729-321-57	(F210)TRANSISTOR 2SC4386-0PY-LF (F110)TRANSISTOR 2SC4385-0PY-LF

Note: The components identified by mark A or dotted line with mark A are critical for safety.

Replace only with part number specified.

Dof No	Down No.	Danasiski			0.6.4	<b>5</b>						
Ref.No.	Part No.	Description			Ref.No.	Part No.	Description					
Q503 Q503	8-729-321-56 8-729-321-58	(F210)TRANSISTO	R 2SA1 R 2SA1	671-0PY-LF 670-0PY-LF	R217 R218 R219	1-247-903-00 1-247-903-00 1-247-903-00	(F210)CARE CARBON CARBON	30N 1M 1M	1M 5% 5%	5% 1/4h 1/4h		
Q504 Q601	8-729-108-06 8-729-119-78	TRANSISTOR 2SC1841 TRANSISTOR 2SC2785	-HFE		R220	1-247-903-00	CARBON	lM	5%	1/4W		
Q602 Q602	8-729-321-55 8-729-321-57	(F210)TRANSISTO	R 2SC4: R 2SC4:	386-0PY-LF 385-0PY-LF	R221 R301 R302	1-247-903-00 1-247-700-11 1-246-545-00	CARBON CARBON CARBON	1M 100 1M	5% 5% 5%	1/4W 1/4W 1/4W	l	
Q603 Q603	8-729-321-56 8-729-321-58	(F210)TRANSISTON	R 2SA16 R 2SA16	671-0PY-LF 670-0PY-LF	R303 R304 R305	1-247-717-11 1-247-722-11 1-246-545-00	CARBON CARBON CARBON	2.2K 5.6K 1M	5% 5%	1/4W 1/4W	1	
Q604 Q701 Q704	8-729-108-06 8-729-900-63 8-729-245-82	TRANSISTOR 2SC1841 TRANSISTOR DTA124ES TRANSISTOR 2SC2458-			R307 R308	1-247-152-00 1-247-170-00	CARBON CARBON	7.5K 43K	5% 5% 5%	1/4W 1/4W 1/4W	!	
Q801 Q802	8-729-177-42 8-729-140-97	(F210)TRANSISTOR			R309 R310	1-249-464-11	CARBON	39K 47K	5% 5%	1/4W 1/4W	,	
R11 R12 R13	1-249-405-11 1-249-405-11 1-249-405-11	CARBON 100 CARBON 100 CARBON 100	5% 5% 5%	1/4W 1/4W 1/4W	R311 R312 R313	1-249-433-11 1-249-441-11 1-247-903-00	(F210)CARB (F210)CARB (F210)CARB	ON	22K 100K	5% 5%	1/4W	
R101 R102	1-247-713-11 1-247-708-11	(F210)CARBON (F210:WG)CARBON	1K 470	5% 1/4W 5% 1/4W	R314 R401	1-247-700-11	(F210)CARB CARBON	ON 0N 100	1M 10K 5%	5% 5% 1/4W	1/4W 1/4W	
R103	1-247-713-11	CARBON 1K (WG)CARBON	5% 470	1/4W 5% 1/4W	R402 R403 R404	1-246-545-00 1-247-717-11 1-247-722-11	CARBON CARBON CARBON	1M 2.2K 5.6K	5% 5% 5%	1/4W 1/4W 1/4W		
R105 R106	1-247-708-11	(WG)CARBON	470 470	5% 1/4W 5% 1/4W	R405 R407	1-246-545-00 1-247-152-00	CARBON CARBON	1M 7.5K	5% 5%	1/4W 1/4W		
R107 R108 R109	1-247-708-11 1-247-714-11 1-249-469-11	(WG)CARBON CARBON 1.2K CARBON 100K	470 5% 5%	5% 1/4W 1/4W 1/4W	R408 R409 R410	1-247-170-00	CARBON	43K 39K	5% 5%	1/4W		
	1-247-714-11 1-249-469-11 1-247-712-11	(WG)CARBON CARBON 100K CARBON 820	1.2K 5% 5%	5% 1/4W 1/4W 1/4W	R410 R411	1-249-465-11 1-249-433-11 1-249-441-11	(F210)CARBO		5% 22K 100K	1/4W 5%	1/4W 1/4W	
R113	1-246-539-00 1-249-618-11	(F110)CARBON (F210)CARBON	560K 560K	5% 1/4W 5% 1/4W	R4 13 R4 14	1-247-903-00 1-249-429-11	(F210)CARBO	NC	100K 1M 10K	5%	1/4W 1/4W 1/4W	
R115	1-249-465-11 1-249-469-11	CARBON 47K CARBON 100K	5% 5%	1/4W 1/4W	R501 R502	1-247-713-11 1-249-469-11	CARBON CARBON	1K 100K	5% 5%	1/4W 1/4W		
R117	1-247-903-00	CARBON 220 (F210)CARBON	5% 1M	1/4W 5% 1/4W	R503 R503	1-247-711-11 1-247-712-11		10:AEP, CARBON	820	5% 5%	1/4	
		CARBON 1M CARBON 1M	5% 5%	1/4W 1/4W	R503 R504	1-247-714-11	(F110:AEP, WG).			5%	1/4	W
R121	1-247-903-00	CARBON 1M CARBON 1M (F210)CARBON	5% 5% 1K	1/4W 1/4W 5% 1/4W	R504 R505	1-249-721-11	(F210)CARBO		100k 100k 5%		1/2' 1/2'	
R202 R203	1-247-708-11 1-247-713-11	(F210:WG)CARBON CARBON 1K	470 5%	5% 1/4W	R506 R507	1-249-423-11 1-249-419-11	CARBON CARBON		5 <b>%</b>	1/4W 1/4W		
R205	1-247-708-11			5% 1/4W % 1/4W	R509 ∕∧	.1-247-688-11 .1-216-361-00 .1-216-361-00	CARBON METAL OXIDE (F210)METAL	10 0.22 . OXIDE	5% 5% 0.22	1/4W 2W 5%	F F 2W	F
R207	1-247-708-11	(WG)CARBON 4	70 5	% 1/4W % 1/4W	R511 <u>∧</u> R512 <u>∧</u>	.1-247-688-11 .1-247-704-11	CARBON CARBON	10 220	5% 5%	1/4W 1/4W		
R209	1-249-469-11	CARBON 1.2K CARBON 100K (WG)CARBON	5% 5% 1.2K	1/4W 1/4W 5% 1/4W	R513 R513	1-247-719-11 1-247-724-11	(F110: AEP, WG). (F110: UK, E)	· · CARB	ON 8.2	K 5%	1/4W	
R211 R212		CARBON 100K CARBON 820	5% 5%	1/4W 1/4W	R513 R513 R514	1-247-725-11 1-249-464-11 1-247-727-11	(F210: AEP, WG). (F210: UK)	• • CARB	ON 39K	5%	1/4W 1/4W	
R213		(F110)CARBON (F210)CARBON	560K 560K	5% 1/4W 5% 1/4W	R5 15 R5 16	1-247-727-11 1-247-727-11	CARBON	47K	5%	1/2W 1/4W 1/2W		
R215	1-249-469-11	CARBON 47K CARBON 100K CARBON 220	5% 5% 5%	1/4W 1/4W 1/4W		.1-216-361-00 .1-216-361-00 1-247-713-11 1-249-469-11	(F210)METAL		0.22	2W 5% 1/4W 1/4W	F 2W	F
				I	-			• •		,		

Note: The components identified by mark \( \frac{\Lambda}{\Lambda} \) or dotted line with mark \( \frac{\Lambda}{\Lambda} \) are critical for safety. Replace only with part number specified.

Ref.No. Part No.	Description
R603 1-247-711-11 R603 1-247-712-11	(F210:UK)CARBON 680 5% 1/4W (F110:UK,E/F210:AEP,WG)
R603 1-247-714-11	CARBON 820 5% 1/4W (F110: AEP, WG)CARBON 1.2K 5% 1/4W
R604 1-249-496-11 R604 1-249-721-11	(F110)CARBON 100K 5% 1/2W (F210)CARBON 100K 5% 1/2W
R605 1-249-460-11 R606 1-249-423-11 R607 1-249-419-11	CARBON 15K 5% 1/4W CARBON 3.3K 5% 1/4W CARBON 1.5K 5% 1/4W
R608 A.1-247-688-11 R609 A.1-216-361-00 R610 A.1-216-361-00	CARBON 10 5% 1/4W F METAL OXIDE 0.22 5% 2W F (F210)METAL OXIDE 0.22 5% 2W F
R611 <u>A</u> .1-247-688-11 R612 <u>A</u> .1-247-704-11	CARBON 10 5% 1/4W F CARBON 220 5% 1/4W F
R613 1-247-719-11 R613 1-247-724-11 R613 1-247-725-11 R613 1-249-464-11	(F110: AEP, WG)CARBON 3.3K 5% 1/4W (F110: UK, E)CARBON 8.2K 5% 1/4W (F210: AEP, WG)CARBON 10K 5% 1/4W (F210: UK)CARBON 39K 5% 1/4W
R614 1-247-727-11 R615 1-249-466-11 R616 1-247-727-11	CARBON 10 5% 1/2W CARBON 56K 5% 1/4W CARBON 10 5% 1/2W
R621 <u>A</u> .1-216-361-00 R622 <u>A</u> .1-216-361-00	METAL OXIDE 0.22 5% 2W F (F210)METAL OXIDE 0.22 5% 2W F
R701 1-247-723-11 R701 1-247-724-11 R701 1-247-725-11 R701 1-249-460-11	(F110: AEP, WG)CARBON 6.8K 5% 1/4W (F110: UK, E)CARBON 8.2K 5% 1/4W (F210: AEP, WG)CARBON 10K 5% 1/4W (F210: UK)CARBON 15K 5% 1/4W
R702 1-249-437-11 R703 1-249-441-11 R704 1-249-437-11	CARBON 47K 5% 1/4W CARBON 100K 5% 1/4W CARBON 47K 5% 1/4W
R705 <u>A</u> .1-215-890-11	(F110:E/F210:AEP) METAL OXIDE 470 5% 2W F
R705 A.1-215-891-11 R705 A.1-216-428-00 R705 A.1-216-430-11	(F210:UK)METAL OXIDE 680 5% 2W F (F110:AEP, WG)METAL OXIDE 180 5% 1W F (F110:UK)METAL OXIDE 390 5% 1W F
R706 1-247-725-11 R706 1-249-459-11	(F110: AEP, WG)CARBON 10K 5% 1/4W (F110:UK,E/F210: AEP, WG)
R706 1-249-460-11	CARBON 12K 5% 1/4W (F210:UK)CARBON 15K 5% 1/4W
R708 1-249-419-11	CARBON 1.5K 5% 1/4W
R801 <u>A</u> .1-215-911-11 R801 <u>A</u> .1-215-914-11	(F110:AEP, WG)METAL OXIDE 100 5% 3W F (F110:E/F210:AEP, WG) METAL OXIDE 330 5% 3W F
R801 <u>A</u> 1-216-477-11 R801 <u>A</u> 1-216-478-11	(F110:UK)METAL OXIDE 270 5% 3W F (F210:UK)METAL OXIDE 390 5% 3W F
R802 A. 1-215-917-11 R802 A. 1-216-478-11 R802 A. 1-216-481-11	(F110:UK)METAL OXIDE 1K 5% 3W F (F110:AEP, WG)METAL OXIDE 390 5% 3W F (F110:E/F210:AEP, WG)
R802 <u>A</u> .1-216-482-11	METAL OXIDE 1.2K 5% 3W F (F210:UK)METAL OXIDE 1.8K 5% 3W F
R803 <u>A</u> .1-249-447-11 R803 <u>A</u> .1-249-451-11	(F110)CARBON 1 5% 1/4W F (F210)CARBON 2.2 5% 1/4W F
R804 A.1-249-447-11 R804 A.1-249-451-11	(F110)CARBON 1 5% 1/4W F (F210)CARBON 2.2 5% 1/4W F
R805 <u>A</u> .1-247-713-11 R805 <u>A</u> .1-249-381-11	(F210)CARBON 1K 5% 1/4W F (F110)CARBON 1 5% 1/4W F
R806 <u>A</u> .1-247-715-11 R806 <u>A</u> .1-249-381-11	(F210)CARBON 1.5K 5% 1/4W F (F110)CARBON 1 5% 1/4W F

Ref.No. Part No.	Description
R807 <u>A</u> .1-247-695-11 R807 <u>A</u> .1-247-697-00	(F210:AEP, WG)CARBON 39 5% 1/4W F (F210:UK)CARBON 56 5% 1/4W F
R901 1-247-743-11 R901 1-247-744-11 R901 1-247-745-11	(AEP, WG)CARBON 220 5% 1/2W (F210:UK)CARBON 270 5% 1/2W (F110:UK,E)CARBON 330 5% 1/2W
R902 1-247-743-11 R902 1-247-744-11 R902 1-247-745-11	(AEP, WG)CARBON 220 5% 1/2W (F210:UK)CARBON 270 5% 1/2W (F110:UK,E)CARBON 330 5% 1/2W
R903 1-247-727-11 R904 1-247-727-11 R905 1-247-727-11 R906 1-247-727-11	(WG)CARBON     10     5%     1/2W       (WG)CARBON     10     5%     1/2W       (WG)CARBON     10     5%     1/2W       (WG)CARBON     10     5%     1/2W
R907 1-249-412-11 R908 1-249-413-11 R909 1-249-413-11	CARBON 390 5% 1/4W CARBON 470 5% 1/4W CARBON 470 5% 1/4W
R911 1-247-743-11 R911 1-247-744-11 R911 1-247-745-11	(AEP, WG)CARBON 220 5% 1/2W (F210:UK)CARBON 270 5% 1/2W (F110:UK,E)CARBON 330 5% 1/2W
R912 1-247-743-11 R912 1-247-744-11 R912 1-247-745-11	(AEP, WG)CARBON 220 5% 1/2W (F210:UK)CARBON 270 5% 1/2W (F110:UK,E)CARBON 330 5% 1/2W
RV301 1-238-513-11 RV302 1-238-514-11 RV303 1-238-515-11	RES, VAR, CARBON 150K/150K (BALANCE) RES, VAR 250K/250K (TONE:TREBLE) RES, VAR, CARBON 520K/520K (TONE:BASS)
RV304 1-238-512-11 RV501 1-237-455-11 RV601 1-237-455-11	RES, VAR, CARBON 120K/120K (VOLUME) RES, ADJ, CARBON 500 RES, ADJ, CARBON 500
RY701 1-515-501-00 RY701 1-515-533-11	(F210)RELAY (F110)RELAY
S1 <u>A</u> 1-554-920-21 S301 1-571-871-11	SWITCH, PUSH (AC POWER)(1 KEY)(POWER) (F210)SWITCH, ROTARY SLIDDE (INPUT SELECTOR)
S302 1-571-871-11	(F210)SWITCH, ROTARY SLIDDE (REC OUT SELECTOR)
S302 1-571-873 <b>-</b> 11	(F110)SWITCH, ROTARY SLIDE (INPUT SELECTOR)
S303 1-571-828-11	SWITCH, PUSH (1 KEY)(SOURCE DIRECT)
\$304 1-571-828-11 \$304 1-571-872-11	(F210)SWITCH, PUSH(1 KEY)(LOUDNESS) (F110)SWITCH, PUSH(1KEY) (TAPE/DAT MONITER)
S901 1-571-870-11	SWITCH, ROTARY SLIDDE (SPEAKERS)
T1	(F210:AEP, WG). TRANSFORMER, POWER (F210:UK)TRANSFORMER, POWER (F110:AEP, WG). TRANSFORMER, POWER (F110:UK)TRANSFORMER, POWER (F110:E)TRANSFORMER, POWER
TM901 1-537-227-11	(AEP)TERMINAL BOARD (SP) (SPEAKER A/B)
TM901 1-537-228-11	(WG,UK,F110:E)TERMINAL BOARD (SP) (SPEAKER A/B)
TP1 *1-535-115-00 TP2 *1-535-115-00	TERMINAL TERMINAL
VS1 <u>A</u> .1-570-307-11	(F110:E)SWITCH, VOLTEGE CHANGE (VOLTAGE SELECTOR)

Note: The components identified by mark  $\bigwedge$  or dotted line with mark  $\bigwedge$  are critical for safety. Replace only with part number specified.

#### ACCESSORY & PACKING MATERIAL

3-750-399-11 (EXCEPT WG)...MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE)
3-750-399-41 (WG)...MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN)
(WG)...MANUAL, INSTRUCTION (GERMAN)

\*4-929-258-01 (F110)...INDIVIDUAL CARTON

\*4-929-259-01 CUSHION

9-953-745-12